REMARKS

In response to the above Office Action, claim 1 has been amended to more clearly recite the invention being claimed and to recite that the polyolefin resin mixed with the polyester resin material forming the extremely fine fibers of the extremely fine fiber nonwoven fabric layer of the invention is mainly scattered in a surface of the extremely fine fibers as a discontinuous phase, in a longitudinal direction. This can be seen in Fig. 3 of the application and its description on page 4, lines 29-31 and page 6, lines 6-9 of the specification where it is noted that the polypropylene resin (i.e., the polyolefin resin) phase is discontinuously scattered in the exposed surface of the extremely fine fibers (F) formed out of a polyester resin material (a) and the polyolefin resin phase (b).

In the Office Action the Examiner rejected claims 1, 2, 5, 6, 10 and 14-17, all of the claims pending in the case, under 35 U.S.C. § 103(a) for being obvious over Perkins in view of Bansal and evidenced by a newly cited reference to Matsui et al. (U.S. 6,174,602), hereafter Matsui. The withdrawal of the previous rejection of the claims over Perkins in view of Bansal and Unitika is appreciated. However, it is believed the claims are also not obvious over the newly cited combination of references for the following reasons.

An object of the present invention is to provide a highly water-resistant polyester nonwoven fabric that is excellent in water resistance and has a high heat resistance and a high tensile strength.

The present inventors have discovered that the above objects can be achieved by forming a laminated nonwoven fabric out of (1) an extremely fine fiber nonwoven fabric layer where the fibers are prepared by mixing a polyester resin having a specific

solution viscosity with a specific amount of a polyolefin resin having a specific MFR (melt flow rate) and (2) a filamentary fiber nonwoven fabric layer mainly containing a polyester resin.

More specifically, and as set forth in amended claim 1, the present invention provides a highly water pressure-resistant polyester nonwoven fabric composed of a laminated nonwoven fabric structure, wherein an extremely fine fiber nonwoven fabric layer formed out of extremely fine fibers composed of a polyester resin material that is mixed with 10% to 50% by weight of a polyolefin resin and having a fiber diameter of 5 μm or less, and a filamentary fiber nonwoven fabric layer composed of a polyester resin containing 7% by weight or less of a polyolefin resin and having a fiber diameter of 7 μm or more are integrated by thermocompressive bonding, wherein the extremely fine fibers forming the extremely fine fiber nonwoven fabric are formed out of a polyester resin having a solution viscosity from 0.2 to 0.8 η_{sp}/C, the polyolefin resin mixed with the polyester resin forming the extremely fine fibers has a MFR (melt flow rate), which is determined under a temperature of 230° and a load of 21.18 N in accordance with JIS K 7210, of 500 to 3,000 g/10 min, and is mainly scattered in a surface of the extremely fine fibers as a discontinuous phase, in a longitudinal direction, the extremely fine fibers do not have a sheath-core structure, and the laminated structure has a water pressure-resistance of 5.2 kPa or more.

In the present invention, the extremely fine fiber nonwoven fabric layer (M layer) contains 10% to 50% by weight of a polyolefin resin and the filamentary fiber nonwoven fabric layer (S layer) contains 7% by weight or less of a polyolefin resin. Therefore, the amount of the polyolefin resin in the M layer is larger than that in the S layer. As the

result, the claimed polyester nonwoven fabric has excellent water resistance by a multiplier effect of a structural interruption effect due to the M layer itself and a hydrophobic effect due to the polyolefin resin in the M layer.

Especially, when each of the polyester resin and the polyolefin resin in the fiber forming the M layer has a specific viscosity and the fiber forming the M layer has a specific amount of the polyolefin resin, the fiber has a special structure wherein the hydrophobic polyolefin resin is mainly distributed as a discontinuous phase, in a longitudinal direction, in the surface of the extremely fine polyester fibers forming the M layer. This is shown in Fig. 3 of the present specification, and the discontinuously distributed hydrophobic polyolefin resin functions as hydrophobic points in the fabric.

Perkins' fabric provides an improved alcohol repellent and antistatic three-layer nonwoven laminated structure (column 1, lines 37 to 39) and proposes a structure having three melt-extruded nonwoven layers, in which the second layer contains an additive imparting alcohol repellency to the microfibers. Therefore, the object of the invention disclosed in Perkins and the means to attain the object are different from those of the present invention. Accordingly, in Perkins, there is no description and no suggestion regarding water resistance.

As is pointed out by the Examiner, the first and third layers of Perkins' structure contain filaments having a diameter in excess of 7 microns and the second layer consists of filaments with average diameters between 0.1 to 10 microns. Further, Perkins teaches that these layers may be made of a mixture of a polyester resin and a polyolefin resin. Therefore, when the filaments of the second layer have a diameter of 0.1 to 5 microns, the first and third layers of Perkins correspond to the S layer of the

present invention and the second layer corresponds to the M layer of the present invention.

However, Perkins fails to teach an amount of polyolefin resin in each layer and a rate of distribution of polyolefin resin between the second layer and the first and third layers. Further, Perkins fails to teach the viscosity of each resin. Furthermore, there is no description and no suggestion regarding the claimed structure wherein a polyolefin resin is distributed as discontinuous phase, in a longitudinal direction, in the fiber surface of the polyester extremely fine fibers forming the second layer.

Bansal relates to a process for making a nonwoven fabric in which an air jet pulls filaments in the direction that the filaments are traveling (see column 1, lines 13 to 34, and column 12, lines 46 to 50, of Bansal) and the nonwoven fabric obtained is used as a spunbond layer in a spunbond-meltblown-spunbond ("SMS") composite sheet (see column 12, lines 36 to 38, of Bansal). Further, the nonwoven fabric has a fiber diameter of greater than 5 μm (see column 4, lines 8 to 9, of Bansal) and the fiber diameter is 7.5 to 9.4 μm in the examples (see TABLE 1 of Bansal).

Therefore, the nonwoven fabric used as the spunbond layer disclosed in Bansal corresponds to the S layer of the present invention. As described on page 10, lines 15 to 22, of the specification, this spunbonded nonwoven fiber layer can be used as the S layer. Further, in Bansal, the meltblown fiber layer in the above spunbond-meltblown-spunbond ("SMS") composite sheet, corresponds to the M layer of the present invention, but its structure is not detailed. As described on page 9, lines 25 to 35, of the specification, a meltblown fiber layer can be used as the M layer.

As described above, in Perkins, the first and third layers corresponds to the S layer of the present invention and the second layer corresponds to the M layer of the present invention. However, Perkins fails to teach the amount of polyolefin resin in each layer and the rate of distribution of polyolefin resin between the second layer and the first and third layers and that the polyolefin resin is distributed as a discontinuous phase, in a longitudinal direction, in the surface of the fibers forming the second layer.

Although Bansal discloses a spunbonded nonwoven fabric corresponding to the S layer of the present invention and could be used in place of the second layer of Perkins, the meltblown fiber layer of Bansal does not correspond to the M layer of the present invention.

Therefore, even if Perkins is combined with Bansal, it would not be obvious that the amount of the polyolefin resin in the M layer is greater than that in the S layer as in the present invention.

The Examiner argues that the "islands in the sea" arrangement disclosed in Bansal is the same as the claimed structure. However, the claimed structure is different from an "islands in the sea" arrangement, because the island component forms a filament in the sea component and therefore is not distributed as "a discontinuous phase, in a longitudinal direction" as claimed.

In support of his position, the Examiner cites Matsui to show that the sea component of a polyolefin resin is scattered in the surface of the extremely fine fibers directing particular attention to Fig. 3K of Matsui which is described in the reference in column 4, lines 51 and 52 and column 29, lines 2-4 as a sea-islands structure.

In FIG. 3K, as described from column 36, line 55 to column 37, line 55 of Matsui, when the conjugated fiber is subjected to an alkali treatment, the sea component 8 (the composition B3) is removed and the island component 7 (the polymer A3) forms a plurality of filaments. Therefore, since the island component forms a filament in the sea component, the island component is not distributed as discontinuous phase, in a longitudinal direction.

Further, as described in the Reply of October 31, 2007, it is also clear from U.S. Patent No. 3,692,423 that the island component in the "islands in the sea" type conjugated fiber forms a filament in the sea component.

In contrast, in the present invention, the polyolefin is <u>mainly</u> scattered in the surface of the extremely fine fibers as a discontinuous phase, in a longitudinal direction, as shown in Fig. 3 of the specification. On the other hand, in an "islands in the sea" type conjugated fiber as evidenced by Matsui, the island component is <u>uniformly</u> scattered over the whole of the cross section of the fiber as clearly shown n FIG. 3K of Matsui. Thus the claimed structure of the present invention is different from an "islands in the sea" arrangement.

For all of the above reasons, it is submitted that the claimed structure of the nonwoven fabric as set forth in amended claim 1 or in claims 2, 5, 6, 10, and 14-17 dependent therefrom is not obvious over the cited combination of references. its withdrawal as a ground of rejection of these claims and their allowance is therefore requested.

An RCE is being filed with this Reply to enable the Examiner to consider the amended claims at this time.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

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By: [signature]

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